Claims

1. A transmission method comprising:

constructing layered channel symbols as linear combinations of complex modulation symbols; and

transmitting the channel symbols via at least two transmit paths;

using, when constructing the channel symbols, at least a first non-zero coefficient and a second non-zero coefficient in at least one layer when performing a linear combination, wherein the ratio of the first coefficient and the second coefficient is not a real number; and

using, for at least one modulation symbol, a first non-zero total power for transmission on a first transmit path of the at least two transmit paths, and a second non-zero total power for transmission on a second transmit path of the at least two transmit paths, wherein the first and second total powers are not equal.

2. A data transmission method of claim 1, further comprising: using at least one complex precoder matrix that comprises at least two non-zero elements that have different transmission powers.

3. A data transmission method of claim 1, further comprising: using at least one real precoder matrix, wherein a transmission power ratio between symbols transmitted at different times within a layer is at least 2/8.

4. A data transmission method of claim 1, wherein the channel symbols transmitted using different transmit paths and different times form equidistant QAM constellations.

5. A data transmission method of claim 1, wherein the channel symbols transmitted using different transmit paths and different times form a lattice.

6. A data transmission method of claim 5, wherein the lattice is equidistant.

7. A transmitter comprising:

antenna means for achieving two transmit paths for transmission of a signal;

means for modulating the signal to be transmitted into complex modulation symbols;

means for constructing layered channel symbols as linear combinations of the complex modulation symbols;

means for constructing channel symbols by using at least a first non-zero coefficient and a second non-zero coefficient in at least one layer

when performing the linear combinations, wherein the ratio of the first and second coefficient is not a real number; and

means for transmitting the channel symbols by using, for at least one modulation symbol, a first non-zero total power for transmission on a first transmit path, and a second non-zero total power for transmission on a second transmit path, wherein the first and second total powers are not equal.

8. A transmitter comprising:

an antenna system for achieving two transmit paths for transmission of a signal;

a first modulator for modulating the signal to be transmitted into complex modulation symbols;

a second modulator for constructing layered channel symbols as linear combinations of the complex modulation symbols, wherein

the second modulator is configured to construct the channel symbols by using at least a first non-zero coefficient and a second non-zero coefficient in at least one layer when performing the linear combination, wherein the ratio of the first and second coefficient is not a real number; and

the second modulator and the antenna system are configured to transmit the channel symbols by using, for at least one modulation symbol, a first non-zero total power for transmission on a first transmit path, and a second non-zero total power for transmission on a second transmit path, wherein the first and second total powers are not equal.

9. The transmitter of claim 7, wherein the transmitter comprises means for transmitting the channel symbols by using at least one complex precoder matrix that comprises at least two non-zero elements that have different transmission powers.

10. The transmitter of claim 7, wherein the transmitter comprises means for transmitting the channel symbols by using at least one real precoder matrix, wherein a transmission power ratio between symbols transmitted at different times within a layer is at least 2/8.

11. A base station transmitter of a cellular radio system, comprising:

an antenna system for achieving two transmit paths for transmission of a signal;

a first modulator for modulating the signal to be transmitted into complex modulation symbols; and

a second modulator for constructing layered channel symbols as linear combinations of the complex modulation symbols, wherein

the second modulator is configured to construct the channel symbols by using at least a first non-zero coefficient and a second non-zero coefficient in at least one layer when performing the linear combination, wherein the ratio of the first and second coefficient is not a real number, and

the second modulator and the antenna system are configured to transmit the channel symbols by using, for at least one modulation symbol, a first non-zero total power for transmission on a first transmit path, and a second non-zero total power for transmission on a second transmit path, wherein the first and second total powers are not equal.

12. Terminal equipment of a cellular radio system, comprising:

an antenna system for achieving two transmit paths for transmission of a signal;

a first modulator for modulating the signal to be transmitted into complex modulation symbols; and

a second modulator for constructing layered channel symbols as linear combinations of the complex modulation symbols, wherein

the second modulator is configured to construct channel symbols by using at least a first non-zero coefficient and a second non-zero coefficient in at least one layer when performing the linear combination, wherein the ratio of the first and second coefficient is not a real number, and

the second modulator and the antenna system are configured to transmit the channel symbols by using, for at least one modulation symbol, a first non-zero total power for transmission on a first transmit path, and a second non-zero total power for transmission on a second transmit path, wherein the first and second total powers are not equal.